A700 Series
Variable Frequency Drives

MITSUBISHI
FREQROL-A700

UNSURPASSED POWER AND CONTROL

$^1/_2$-700 HP

MITSUBISHI ELECTRIC
AUTOMATION, INC.

Empowering Industries

The amazing new A700

Mitsubishi Electric's RSV technology gives you class-leading power, control and flexibility.

What makes RSV (Real Sensorless Vector) special?

Mitsubishi's 'Real Sensorless Vector' or RSV motor control system provides unequalled dynamic performance, ensuring a wider speed range, smoother operation and lower motor currents than ever before. RSV starts with a highly accurate motor 'map', obtained during an auto-tune procedure which applies alternating voltage to the motor and determines critical motor characteristics. At the heart of RSV is the Adaptive Flux Observer system which compares actual motor behavior during operation with the theoretical model. Instead of a response to a change in load or speed being fixed, any variations between the theoretical and the actual motor response measured in operation are analyzed by the Flux Observer, which constantly refines the motor map as speed and load conditions change.

- Speed Control with or without torque limit – 200:1 range, driving or overhauling*

- Open Loop Torque Control – including torque at zero speed

* Regenerative or dynamic braking accessory may be needed depending on drive type and application
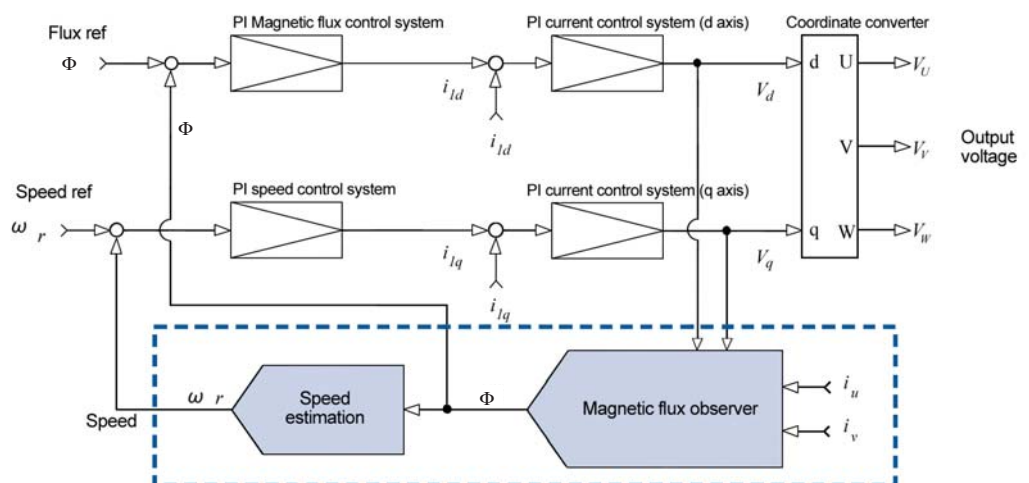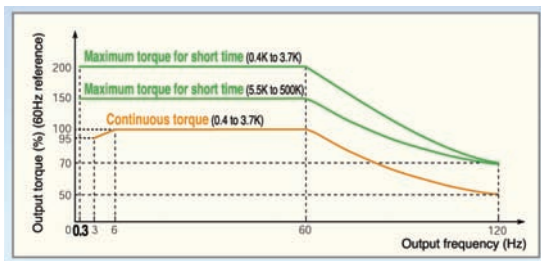
A revolution in dynamic performance.
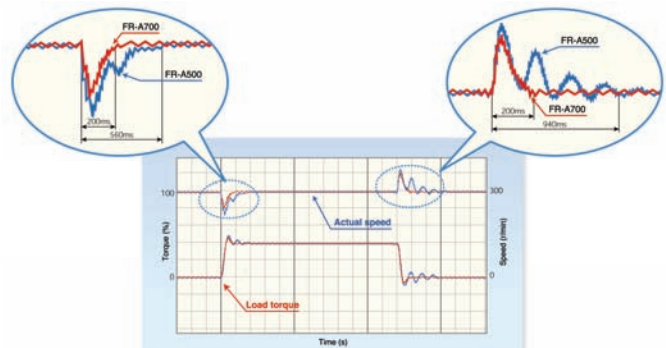
Wide Speed Range

Mitsubishi Electric's new RSV algorithm gives 200:1 speed range open loop.

Fast Response

300 rads/sec response time means lightning-fast response to sudden load changes

Actual Speed Variation When an Impact Load is Connected

PLC Feature

A700 programmability provides true intelligence inside the drive – a simple solution for complex applications
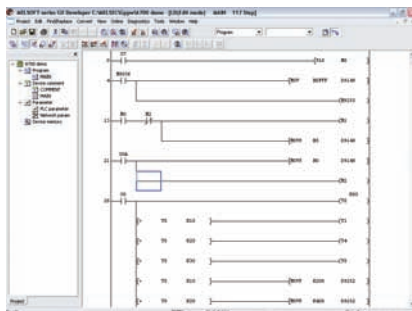
USB Port

Allows simple connection to new FR-Configurator software for quick and easy commissioning

Easy Gain Tuning

A700 uses servo-drive technology to compensate automatically for changes in load inertia

Power-Down Braking

Keeps the motor under control even if supply power is lost
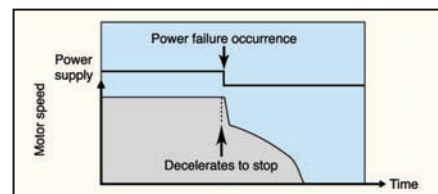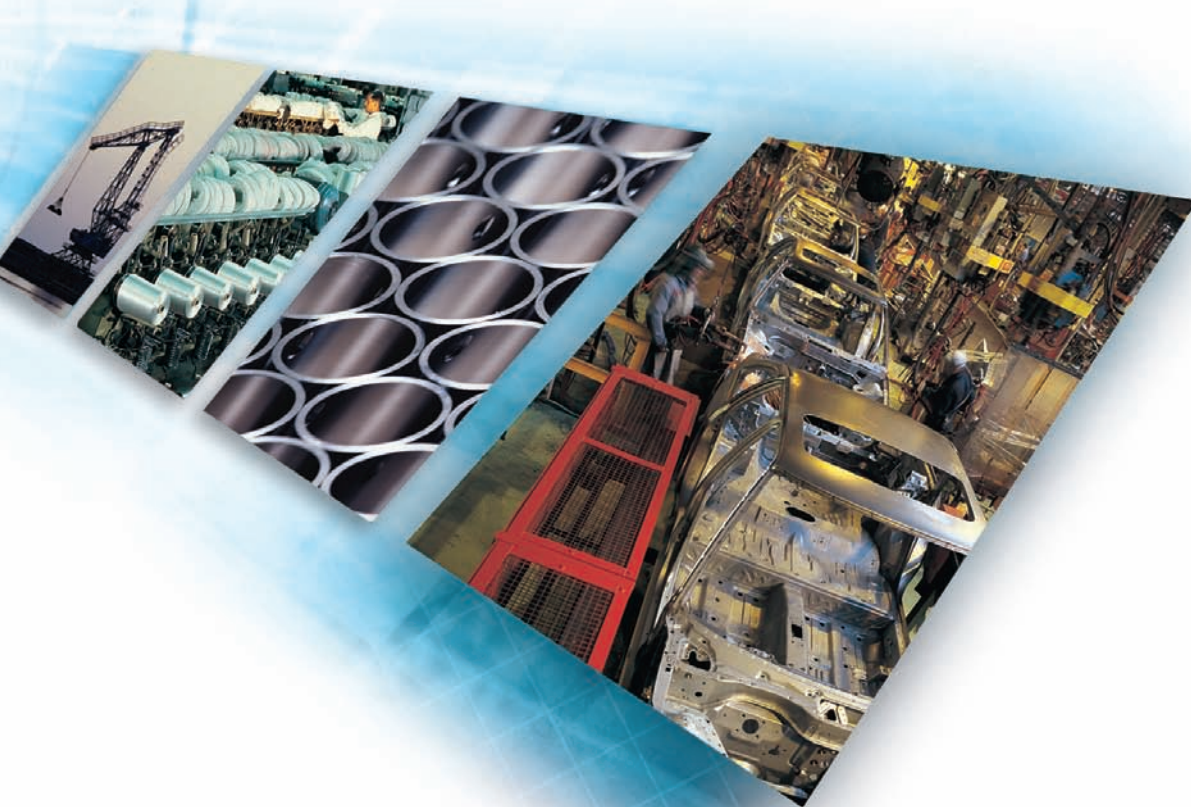
Design Life

10 Year Design Life

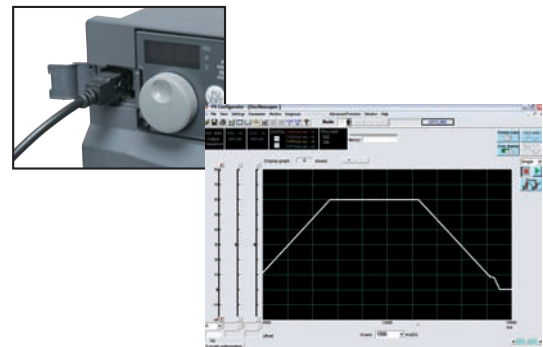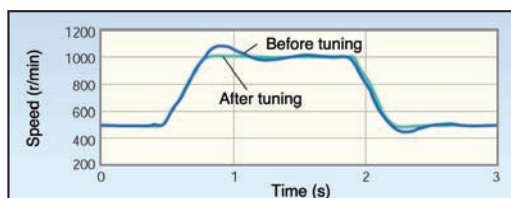A700's Diagnostic Check system will pre-empt component failure
- Capacitors
- Inrush circuit
- Cooling Fans

COMPONENT	A700 LIFE DESIGN	JEMA LIFE GUIDELINE
Cooling Fan	10 years	2 to 3 years
Main Circuit smoothing capacitor	10 years	5 years
Printed board smoothing capacitor	10 years	5 years

Remote I/O Capability
- Status of all I/O can be read over network, including analogs
- Drive outputs can be 'forced' over network Including 2 hard relays
- Drive outputs can be operated independently via PLC function

Bigger Braking Circuit
- Eliminate the need for external brake units on drives up to 30 HP

Integral Radio Filter
- Limits Radio Noise to meet EC Directive 89/336 – all drive sizes

Advanced Keypad Option (PU07)

- 24 button keypad
- Alphanumeric Display (LCD)
- Upload / Download Parameter sets
- Store up to 3 sets of drive data
- Battery option allows data transfer without powering up the drive (FR-PU07-BB)

Flexible Communications

- PROFIBUS-DP
- LonWorks®
- DeviceNet™
- CC-Link®
- Ethernet/IP™
- Modbus® TCP/IP
- Mitsubishi RS485
- Modbus® RTU
- PROFINET
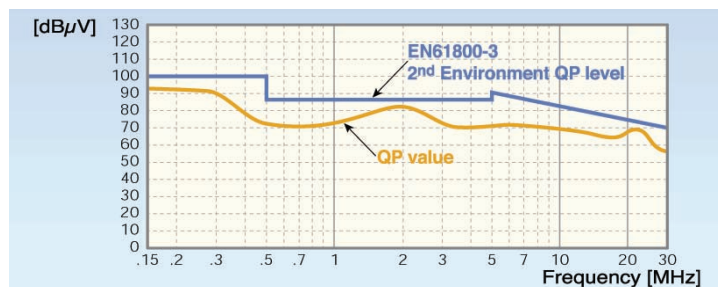- SSCNetIII
- ControlNet™
- Metasys® N2
- Siemens® FLN

LonWorks is a registered trademark of EchelonCorporation. Ethernet/IP and DeviceNet are trademarks of ControlNet International, Ltd. under license by Open DeviceNet Vendor Association, Inc. CC-Link is a registered trademark of the CC-Link Partner Association. Modbus is a registered trademark of Schneider Electric. ControlNet is a trademark of ControlNet International, Ltd. Metasys is a registered trademark of Johnson Controls, Inc. Siemens is a registered trademark of the Siemens Corp.

Cards

FR-A7AP (Encoder Feedback)
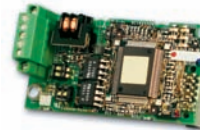
FR-A7NC (CC-Link)

FR-A7NE (Ethernet/IP)

FR-A7AR (Relay Output)

Additional Features

- On-line auto-tune feature compensates for motor temperature changes
- Pulse train input for accurate speed control
- Sink/Source logic selectable
- Removable Control Terminal Block for easy maintenance
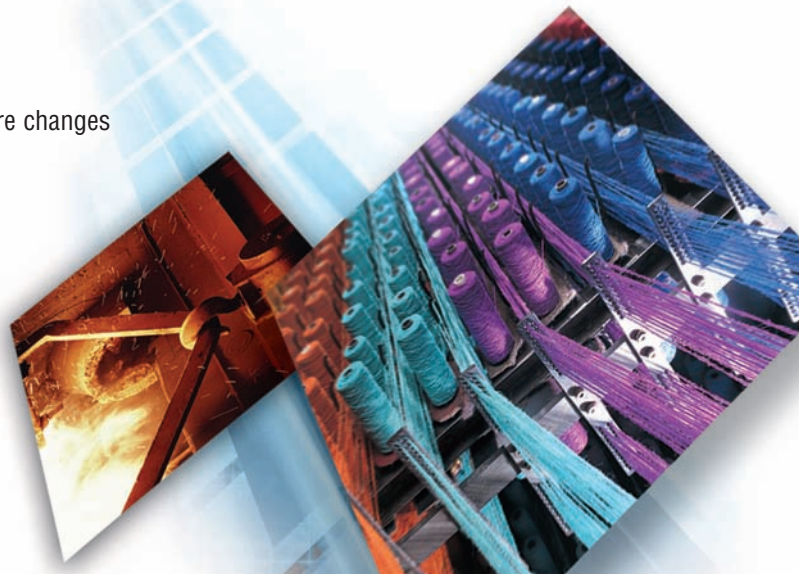
Peripheral Equipment

USB Connection
• Allows commissioning of drive from PC with FR-Configurator software
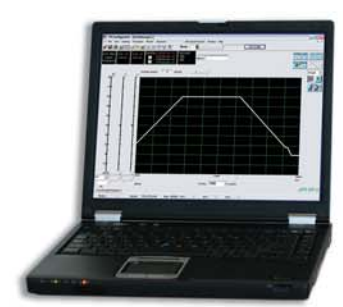
Three Phase Supply

MRL Series Line Reactors
• Absorb power line spikes
• Prevent nuisance tripping
• Reduce harmonics to comply wih IEEE519
• Protect input diodes

R
S
T
from supply

External Braking
• Heavy Duty Brake Units. Types UFS, FR-BU2
• CV Regeneration unit energy recovery device allows 100% braking torque continuously

P/+   PR
P/+
PR

N   P

to motor
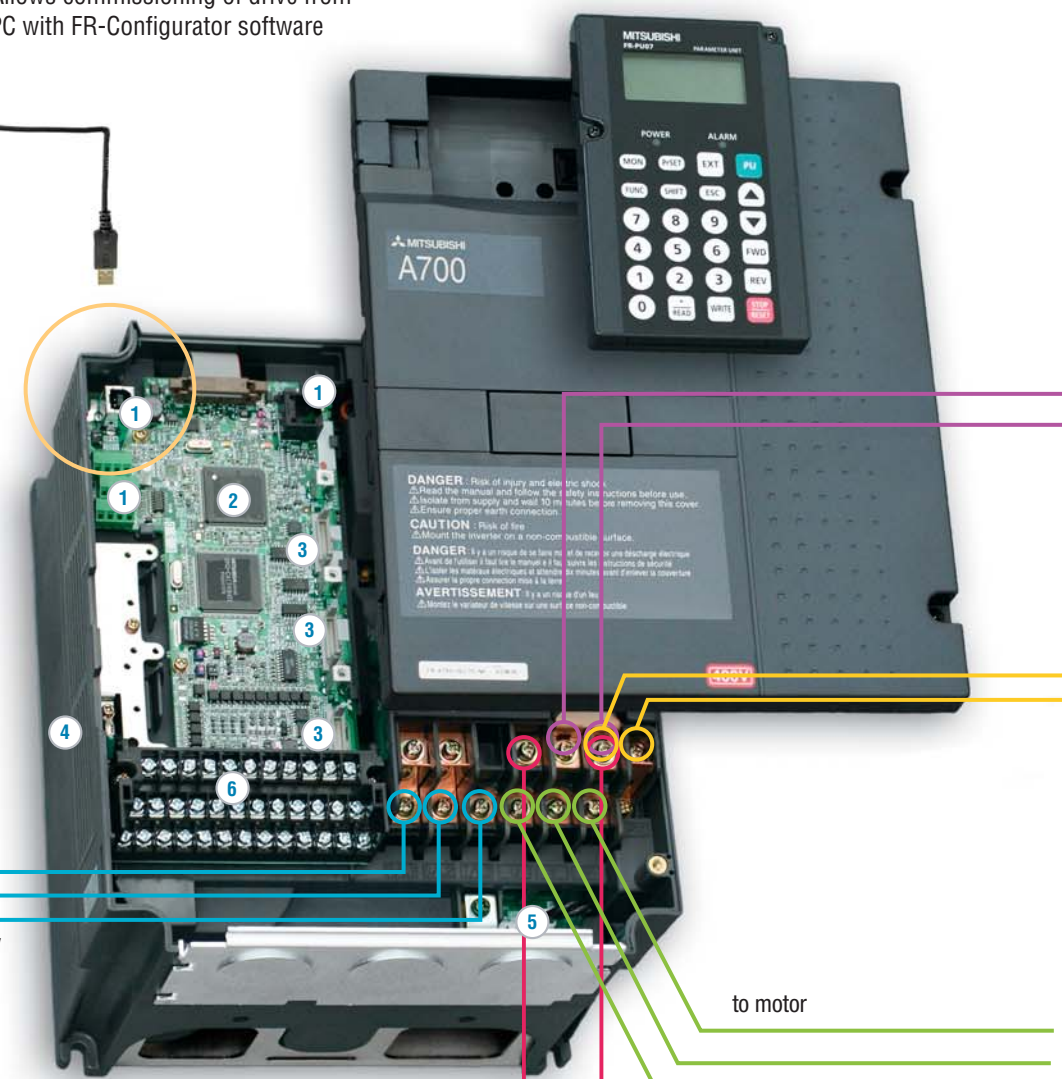
DC Link Choke Option
M_RB (standard on frame size J and above)
• Reduce AC input line current harmonic distortion
• Absorb DC bus voltage spikes

P1
P

P
PR

Built-in Braking
• Internal brake transistor standard up to 30HP (ND based)
• Internal brake resistor standard up to 10HP (ND based)

BLF Ferrite Core
• Use as needed to control radiated RFI from drive output

W
V
U

MRL Series Load Reactors
• For motor lead length in excess of 500 ft.
• Reduce output voltage dv/dt
• Extend semiconductor life

Marathon Motors
• Fractional to 1250HP
• DPFV, TEFC, TENV, TEBC

POWER FLEXIBILITY CONTROL

1 Three Serial Communications Ports
• Simple connectivity to various devices, including Human Machine Interfaces and networks

2 Embedded Programmable Logic Controller
• Simple user customization of drive control and I/O based on internal variables such as timers, counters or user parameter settings

3 Three Option Ports
• Flexible choices allow user to select application specific options such as DeviceNet™, Ethernet I/P™, ControlNet™, encoder, expanded I/O, and more

4 UL Type 1 Construction
• Allows direct conduit mounting - outside of an enclosure, in the proper environment
• Available up to 30HP without option (ND based), larger capacities available with option

5 Built-in EMC Filter
• Limits radio noise to meet EC directive 89/336 (EN 61800-3)

6 Removable Terminal Block
• Allows for easy maintenance

Standard Specifications

Ratings 240 V Class

				00030	00050	00080	00110	00175	00240	00330	00460	00610	00760	00900	01150	01450	01750	02150	02880	03460
Model		FR-A720- □□□□-NA		00030	00050	00080	00110	00175	00240	00330	00460	00610	00760	00900	01150	01450	01750	02150	02880	03460
Output	Rating	ND 150% 60s, 200% 3s 50ºC ambient [1]	HP	1/2	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100	125
			AMPS	3.0	5.0	8.0	11	17.5	24	33	46	61	76	90	115	145	175	215	288	346
		HD 200% 60s, 250% 3s 50ºC ambient [1]	HP	1/4	1/2	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100
			AMPS	1.5	3.0	5.0	8.0	11	17.5	24	33	46	61	76	90	115	145	175	215	288
		LD 120% 60s, 150% 3s 50ºC ambient [1]	HP	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100	125	150
			AMPS	4.2	6.5	9.6	15.2	24	31	45	58	70	85	114[4]	140	170	212	288[3]	346	432
		SLD 110% 60s, 120% 3s 40ºC ambient [1]	HP	1	2	3	5	7 1/2	10	15	20	25	30	40	50/60	60	75	100/125	150	200
			AMPS	4.6	7.1	10.5	16.7	25	34	49	63	77	93	125[4]	154	187	233	316[3]	380	475
Voltage[2]				3 phase 200 - 220V 50Hz, 200 - 240V 60Hz																
Frame Size				A	B	C			D		E	F			G	H		JA	K	
Approximate Weight lbs (kg)				4.2(1.9)	5 (2.3)	8.4 (3.8)			15.6 (7.1)		16 (7.5)	28.6 (13)		30.9(14)	50.6(23)	77 (35)		128 (58)	158 (72)	
Regenerative braking torque	Maximum value / permissible duty			150% torque / 3%ED					100% torque / 3%ED		100% torque / 2%ED	20% torque / continuous (Brake transistor is included)			20% torque / continuous				10% torque / continuous	
Power Supply	Rated input AC voltage, frequency			3 phase 200 - 220V 50Hz, 200 - 240V 60Hz																
	Permissible AC voltage fluctuation			170 - 242V 50Hz, 170 - 264V 60Hz																
	Permissible frequency fluctuation			+/-5%																
	Protective structure			NEMA 1 [4]								Enclosed Type - UL Type 1			NEMA 1 [4]				IP00 Open Type	
	Cooling system			Self-cooling		Forced air cooling															

Ratings 480 V Class

				00015	00025	00040	00060	00090	00120	00170	00230	00310	00380	00440	00570	00710	00860	01100
Model		FR-A740- □□□□-NA		00015	00025	00040	00060	00090	00120	00170	00230	00310	00380	00440	00570	00710	00860	01100
Output	Rating	ND 150% 60s, 200% 3s 50ºC ambient [1]	HP	1/2	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75
			AMPS	1.5	2.5	4.0	6.0	9.0	12	17	23	31	38	44	57	71	86	110
		HD 200% 60s, 250% 3s 50ºC ambient [1]	HP	1/4	1/2	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60
			AMPS	0.8	1.5	2.5	4.0	6.0	9.0	12	17	23	31	38	44	57	71	86
		LD 120% 60s, 150% 3s 50ºC ambient [1]	HP	1	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100/150
			AMPS	2.1	3.5	4.8	7.6	11.5	16	23	29	35	43	57	70	85	106	144[3]
		SLD 110% 60s, 120% 3s 40ºC ambient [1]	HP	1	2	3	5	7 1/2	10	15	20	25	30	40	50/60	60	75	100/150
			AMPS	2.3	3.8	5.2	8.3	12.6	17	24	31	38	47	62	77	93	116	180[3]
Voltage[3]				3 phase 380 - 480V 50/60Hz														
Frame Size				C						D	E		F		G	H		
Approximate Weight lbs (kg)				7.7 (3.5)						14.3 (6.5)	16.5 (7.5)		28.6 (13)		50.6 (23)	77 (35)		81.4 (37)
Regenerative braking torque	Maximum value / permissible duty			100% torque / 2%ED							20% torque / continuous (Brake transistor is included)				20% torque / continuous			
Power Supply	Rated input AC voltage, frequency			3 phase 380 - 480V 50/60Hz														
	Permissible AC voltage fluctuation			323 - 528V 50/60Hz														
	Permissible frequency fluctuation			+/-5%														
	Protective structure			NEMA 1 [4]							Enclosed Type - UL Type 1				NEMA 1 [4]			
	Cooling system			Self-cooling			Forced air cooling											

Ratings 480 V Class (continued)

	Model	FR-A740-□□□□-NA		01440	01800	02160	02600	03250	03610	04320	04810	05470	06100	06830	07700	08660	09620
Output — Rating	ND	150% 60s, 200% 3s 50ºC ambient [1]	HP	100	150	150	200	250	300	350	400	450	500	550	650	700	800
			AMPS	144	180	216	260	325	361	432	481	547	610	683	770	866	962
	HD	200% 60s, 250% 3s 50ºC ambient [1]	HP	75	100	150	150	200	250	300	350	400	450	500	550	650	700
			AMPS	110	144	180	216	260	325	361	432	481	547	610	683	770	820
	LD	120% 60s, 150% 3s 50ºC ambient [1]	HP	150	150	200	250	300	350	400	450	500	550	650	700	800	900
			AMPS	180	216	260	325	361	432	481	547	610	683	770	866	962	1094
	SLD	110% 60s, 120% 3s 40ºC ambient [1]	HP	150	200	250	300	350	400	450	500	550	650	700	800	900	1000
			AMPS	216	260	325	361	432	481	547	610	683	770	866	962	1094	1212
	Voltage [2]			3 phase 380 - 480V 50/60Hz													
	Frame Size			J		K		L		M				N		P	
	Approximate Weight lbs (kg)			110 (50)	125 (57)	158 (72)		242 (110)		385 (175)				572 (260)		814 (370)	
	Regenerative braking torque	Maximum value / permissible duty		10% torque / continous													
Power Supply	Rated input AC voltage, frequency			3 phase 380 - 480V 50/60Hz													
	Permissible AC voltage fluctuation			323 - 528V 50/60Hz													
	Permissible frequency fluctuation			+/-5%													
	Protective structure			NEMA 1 [4]						IP00 Open Type							
	Cooling system			Forced air cooling													

Ratings 600 V Class

	Model	FR-A760- □□□□-NA		00017	00040	00061	00120	00220	00330	00550	00840	01040	01310	01520	02210	02550	03040	04020
Output — Rating	ND	150% 60s, 200% 3s 40ºC ambient [1]	HP	1	3	5	10	20	30	50	75	100	125	150	200	250	300	400
			AMPS	1.7	4.0	6.1	12	22	33	55	84	104	131	152	221	255	304	402
	HD	200% 60s, 250% 3s, 280% 0.5s 40ºC ambient [1]	HP	1/2	2	3	7 1/2	10	20	40	60	75	100	125	150	200	250	300
			AMPS	1.0	2.7	4.0	9.0	16	24	41	63	84	104	131	152	202	255	304
	LD	120% 60s, 150% 3s 40ºC ambient [1]	HP	1 1/2	3	5	10	25	40	60	100	125	150	200	250	300	400	500
			AMPS	2.5	5.6	8.2	16	27	41	62	99 [3]	131	152	221	255	304	402	496
	SLD	110% 60s, 120% 3s 40ºC ambient [1]	HP	2	5	7 1/2	15	30	40	60	100	150	150	250	300	350	450	550
			AMPS	2.7	6.1	9.0	17	32	45	68	108 [3]	144	167	243	289	336	442	545
	Voltage [2]			3 phase 525 – 600V 60Hz														
	Frame Size			C			D	E	F	H		J			L		M	N
	Approximate Weight lbs (kg)			8.3 (3.8)			15.6(7.1)	16.5(7.5)	28.6(13)	77 (35)		125 (57)			242 (110)		385 (175)	572 (260)
	Regenerative braking torque	Maximum value / permissible duty		100% torque / 2% ED			20% torque / continuous (Brake transistor included)			20% torque / continuous		10% torque / continuous						
Power Supply	Rated input AC voltage, frequency			3 phase 525 - 600V 60Hz														
	Permissible AC voltage fluctuation			472 - 660V 60Hz														
	Permissible frequency fluctuation			+/-5%														
	Protective structure			Enclosed Type - UL Type 1								IP00 Open Type						
	Cooling system			Self-cooling	Forced air cooling													

Notes:

1. The overload capacity indicated in % is the ratio of the overload current to the inverter's rated current. For repeated duty, allow time for the inverter and motor to return below the temperature under 100% load.
2. The maximum output voltage cannot exceed the power supply voltage. The maximum output voltage may be set as desired below the power supply voltage.
3. DC Link Choke is required.
4. Conduit adapter option required to meet NEMA1 protective structure.

Dimensions - 240V, 480V and 600V drives

Frame Size	Dimensions in inches (mm)		
	Height	Width	Depth
A	10.2 (260)	4.3 (110)	4.3 (110)
B	10.2 (260)	4.3 (110)	4.9 (125)
C	10.2 (260)	5.9 (150)	5.5 (140)
D	10.2 (260)	8.7 (220)	6.7 (170)
E	11.8 (300)	8.7 (220)	7.5 (190)
F	15.8 (400)	9.8 (250)	7.5 (190)
G	21.7 (550)	12.8 (325)	7.7 (195)
H	21.7 (550)	17.1 (435)	9.8 (250)
JA	27.6 (700)	18.3 (465)	9.8 (250)
J	24.4 (620)	18.3 (465)	11.8 (300)
K	29.1 (740)	18.3 (465)	14.2 (360)
L	39.8 (1010)	19.6 (498)	15 (380)
M	39.8 (1010)	26.8 (680)	15 (380)
N	52.4 (1330)	31.1 (790)	17.3 (440)
P	62.2 (1580)	39.2 (995)	17.3 (440)

Details of Factory Supplied DC Link Chokes

VFD Model Number	Dimensions in inches (mm)			Approx Weight
	Height	Width	Depth	lbs (kg)
FR-A720-02880-NA	13.4 (340)	5.9 (150)	7.9 (200)	42 (19)
FR-A720-03460-NA	15.8 (400)	6.9 (175)	7.9 (200)	44 (20)
FR-A740-01440-NA	13.4 (340)	5.9 (150)	7.7 (195)	48 (22)
FR-A740-01800-NA	15.9 (405)	6.9 (175)	7.9 (200)	57 (26)
FR-A740-02160-NA	15.9 (405)	6.9 (175)	8 (205)	62 (28)
FR-A740-02600-NA	15.9 (405)	6.9 (175)	9.4 (240)	64 (29)
FR-A740-03250-NA	15.9 (405)	6.9 (175)	9.4 (240)	66 (30)
FR-A740-03610-NA	17.3 (440)	7.5 (190)	9.8 (250)	77 (35)
FR-A740-04320-NA	17.3 (440)	7.5 (190)	10 (255)	84 (38)
FR-A740-04810-NA	19.5 (495)	8.3 (210)	9.8 (250)	92 (42)
FR-A740-05470-NA	19.5 (495)	8.3 (210)	9.8 (250)	101 (46)
FR-A740-06100-NA	19.7 (500)	9.3 (235)	9.8 (250)	110 (50)
FR-A740-06830-NA	19.7 (500)	9.5 (240)	10.6 (270)	125 (57)
FR-A740-07700-NA	17.9 (455)	8.5 (215)	13.6 (345)	147 (67)
FR-A740-08660-NA	18.1 (460)	8.5 (215)	14.2 (360)	187 (85)
FR-A740-09620-NA	18.1 (460)	8.5 (215)	14.2 (360)	209 (95)
FR-A760-01040-NA	13.4 (340)	5.9 (150)	7.5 (190)	44 (20)
FR-A760-01310-NA	13.4 (340)	5.9 (150)	7.5 (190)	51 (23)
FR-A760-01520-NA	15.9 (405)	6.9 (175)	7.7 (195)	53 (24)
FR-A760-02210-NA	15.9 (405)	6.9 (175)	9.4 (240)	70 (32)
FR-A760-02550-NA	15.9 (405)	6.9 (175)	9.4 (240)	70 (32)
FR-A760-03040-NA	17.3 (440)	7.5 (190)	9.8 (250)	88 (44)
FR-A760-04020-NA	19.5 (495)	8.3 (210)	9.8 (250)	108 (49)

Conduit Attachments

Model Number	FR-A7FN05	FR-A7FN06	FR-A7FN07	FR-A7FN-11	FR-A7FN-12	FR-A7FN-13	FR-A7FN-14
A720	00900	01150	01450, 01750	—	02880, 03460	—	—
A740	—	00570	00710, 00860, 01100	01440, 01800	02160, 02600	03250, 03610	04320, 04810, 05470
A760	—	—	00550, 00840	01040, 01310, 01520	—	02210, 02550	—

Options

Model Number		Function
Plug-in Options *2	FR-A7AX	16 bit digital input
	FR-A7AY	6 bit digital output and two analog outputs (0~10VDC and 0~20mA)
	FR-A7AR	Three form C relay outputs
	FR-A7AP	Encoder input option for vector, orientation, encoder feedback control
	FR-A7AZ	0~±10VDC analog output, 16-bit 0~±10V analog input
	FR-A7AC	120VAC control input, one relay output
	FR-A7AN	4~20mA I/O
Plug-in Network Options *2 *3 *4	FR-A7NC	CC-Link network option
	FR-A7NCN *5	ControlNet network option
	FR-A7ND	DeviceNet network option
	FR-A7NE *5	EtherNet/IP network option
	FR-A7NP	PROFIBUS-DP network option
	FR-A7NS	SSCNETIII network option
	FR-A7NL	LonWorks network option
Software & Cables	FR-A7N-ETH	EtherNet/IP, Modbus TCP/IP & PROFINET network option
	FR-A7N-XLT	Metasys N2 and Siemens FLN network option
	FR-CONFIGURATOR	Setup, monitor and maintenance software
	GX-DEVELOPER	PLC programming software
	SC-FRPC	Communication cable between VFD and PC (RS232) - 3 meters
	SC-FRPC-150	Communication cable between VFD and PC (RS232) - 150 feet
	FR-CB20*	Communication cable between VFD and FR-PU07(-BB)
Dynamic Braking	GT01-C30R4-VFD	Communication cable between VFD and GOT HMI
	FR-ABR-(H)**K-UL	High-duty Brake Resistors for use with internal brake chopper (<30HP)
	FR-BU2-(H)**K	Stand alone Brake Units up to 1000HP
	FR-BR-(H)**K-UL	Brake resistors for FR-BU2
Keypad	FR-PU07	LCD multi-lingual Parameter Unit with copy function
	FR-PU07-BB	Battery powered LCD multi-lingual Parameter Unit with copy function

Notes:
1. A700 can utilize up to three plug-in options.
2. Use of two identical options is not allowed (i.e. two FR-A7AP options can not be used).
3. Plug-in network options should occupy option slot 3.
4. Only one plug-in network option is allowed.
5. These network options occupy two option slots.

General Specification

Control Specifications	Control method		Soft-PWM control/high carrier frequency PWM control (selectable from among V/F control, advanced magnetic flux vector control and real sensorless vector control) / vector control (when used with option FR-A7AP)
	Output frequency range		0.2 to 400Hz
	Frequency setting resolution	Analog Input	0.015Hz/0 to 60Hz (terminal 2, 4: 0 to 10V/12bit) 0.03Hz/0 to 60Hz (terminal 2, 4: 0 to 5V/11bit, 0 to 20mA/about 11bit, terminal 1: 0 to ±10V/12bit) 0.06Hz/0 to 60Hz (terminal 1: 0 to ±5V/11bit)
		Digital Input	0.01Hz
	Frequency accuracy	Analog Input	Within ±0.2% of the max. output frequency (25°C±10°C)
		Digital Input	Within 0.01% of the set output frequency
	Voltage/frequency characteristics		Base frequency can be set from 0 to 400Hz Constant torque/variable torque pattern or adjustable 5 points V/F can be selected
	Starting torque		200% 0.3Hz (up to frame size C), 150% 0.3Hz (Frame Size D and above) (under real sensorless vector control or vector control)
	Torque boost		Manual torque boost
	Acceleration/deceleration time setting		0 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration mode, backlash measures acceleration/deceleration can be selected.
	DC injection brake		Operation frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
	Stall prevention operation level		Operation current level can be set (0 to 220% adjustable), whether to use the function or not can be selected
	Torque limit level		Torque limit value can be set (0 to 400% variable)
Operation Specifications	Frequency setting signal	Analog input	• Terminal 2, 4: 0 to 10V, 0 to 5V, 4 to 20mA can be selected • Terminal 1:-10 to +10V, -5 to +5V can be selected
		Digital input	Input using the setting dial of the operation panel or parameter unit Four-digit BCD or 16 bit binary (when used with option FR-A7AX)
	Start signal		Forward and reverse rotation or start signal automatic self-holding input (3-wire input) can be selected.
	Input signal		Select any twelve signals using Pr. 178 to Pr. 189 (input terminal function selection)from among multi speed selection, remote setting, stop-on-contact, second function selection, third function selection, terminal 4 input selection, JOG operation selection, selection of automatic restart after instantaneous power failure, flying start, external thermal relay input, inverter operation enable signal (FR-HC/FR-CV connection), FR-HC connection (instantaneous power failure detection), PU operation/external inter lock signal , external DC injection brake operation start, PID control enable terminal, brake opening completion signal, PU operation/external operation switchover, load pattern selection forward rotation reverse rotation boost, V/F switching, load torque high-speed frequency, S-pattern acceleration/deceleration C switchover, pre-excitation, output stop, start self-holding selection, control mode changing, torque limit selection, start-time tuning start external input, torque bias selection 1, 2 *1, P/PI control switchover, forward rotation command, reverse rotation command, inverter reset, PTC thermistor input, PID forward reverse operation switchover, PU-NET operation switchover, NET-external operation switchover, and command source switchover.
		Pulse train input	100kpps
	Operational functions		Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection, polarity reversible operation, automatic restart after instantaneous power failure operation, commercial power supply-inverter switchover operation, forward/reverse rotation prevention, remote setting, brake sequence, second function, third function, multi-speed operation, original operation continuation at instantaneous power failure, stop-on-contact control, load torque high speed frequency control, droop control, regeneration avoidance, slip compensation, operation mode selection, offline auto tuning function, online auto tuning function, PID control, computer link operation (RS-485), motor end orientation*1, machine end orientation*1, pre-excitation, notch filter, machine analyzer*1, easy gain tuning, speed feed forward, and torque bias*
	PLC control		Maximum/minimum Integral PLC Feature : I/O including analog : 128 points, sequence instructions : 23, basic instructions : 32, application instructions : 18, input terminals : 12 points, output terminal : 7 points, FR-A7AX input terminals : 16 points, FR-A7AY : 7 points, FR-A7AR : 3 points. Watchdog timer : 10 - 2000 msec, memory capacity : 6 kB as sequence and parameter, program capacity : 1K steps, internal relay : 64 points, timer : 16 points, counter : 16 points, data registers : 120, special relays : 256, special registers : 256. Programming package: GX-Developer.
	Output Signals	Operating status	Select any signals using Pr. 190 to Pr. 196 (output terminal function selection) from among inverter running, up-to-fre-quency, instantaneous power failure/undervoltage, overload warning, output frequency (speed) detection, second output frequency (speed) detection, third output frequency (speed) detection, regenerative brake prealarm, electronic thermal relay function pre-alarm, PU operation mode, inverter operation ready, output current detection, zero current detection, PID lower limit, PID upper limit, PID forward rotation reverse rotation output, commercial power supply-inverter switchover MC1, commercial power supply-inverter switchover MC2, commercial power supply-inverter switchover MC3, orientation completion*1, brake opening request, fan fault output, heatsink overheat pre-alarm , inverter running/start command on, deceleration at an instantaneous power failure, PID control activated, during retry, PID output interruption, life alarm, alarm output 1, 2, 3 (power-off signal), power savings average value update timing, current average monitor, maintenance timer alarm, remote output, forward rotation output*1, reverse rotation output*1, low speed output, torque detection, regenerative status output*1, start-time tuning completion, in-position completion*1, minor failure output and alarm output. Open collector output (5 points), relay output (2 points) and alarm code of the inverter can be output (4 bit) from the open collector.
		When used with the Fr-A7AY, FR-A7AR	In addition to the above, select any signals using Pr. 313 to Pr. 319 (extension output terminal function selection) from among control circuit capacitor life, main circuit capacitor life, cooling fan life, inrush current limit circuit life. (only positive logic can be set for extension terminals of the FR-A7AR)
		Pulse train input	500kpps
	Pulse/analog output		Select any signals using Pr. 54 FM terminal function selection (pulse train output) and Pr. 158 AM terminal function selection (analog output) from among output fre-quency, motor current (steady or peak value), output voltage, frequency setting, operation speed, motor torque, converter output voltage (steady or peak value), electronic thermal relay function load factor, input power, output power, load meter, motor excitation current, reference voltage output, motor load factor, power saving effect, regenerative brake duty, PID set point, PID measured value, motor output, torque command, torque current command, and torque monitor.
Indication	PU (FR-DU0 FR-PU07 FR-PU04)	Operating status	Output frequency, motor current (steady or peak value), output voltage, frequency setting, running speed, motor torque, overload, converter output voltage (steady or peak value), electronic thermal relay function load factor, input power, output power, load meter, motor excitation current, cumulative energization time, actual operation time, motor load factor, cumulative power, energy saving effect, cumulative saving power, regenerative brake duty, PID set point, PID measured value, PID deviation, inverter I/O terminal monitor, input terminal option monitor *1, output terminal option monitor*2, option fitting status*3, terminal assignment status*3, torquecommand, torque current command, feed back pulse*3, motor output
		Alarm definition	Alarm definition is displayed during the protective function is activated, the output voltage/current/frequency/cumulative energization time right before the protection function was activated and past 8 alarm definitions are stored.
		Interactive guidance	Operation guide/trouble shooting with a help function *3
	Protective/warning function		Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage during constant speed, overvoltage during deceleration, inverter protection thermal operation, motor protection thermal operation, heatsink overheat, instantaneous power failure occurrence, undervoltage, input phase failure, motor overload, output side earth (ground) fault overcurrent, output short circuit, main circuit element overheat, output phase failure, external thermal relay operation, PTC thermistor operation, option alarm, parameter error, PU disconnection, retry count excess, CPU alarm, operation panel power supply short circuit, 24VDC power output short circuit, output current detection value excess, inrush current limit circuit alarm, communication alarm (inverter), USB error, opposite rotation deceleration error, analog input error, fan fault, overcurrent stall prevention, overvoltage stall prevention, regenerative brake prealarm, electronic thermal relay function prealarm, PU stop, maintenance timer alarm*2, brake transistor alarm, parameter write error, copy operation error, operation panel lock, parameter copy alarm, speed limit indication, encoder no-signal*1, speed deviation large*1 , overspeed*1, position error large*1, encoder phase error*1
Environment	Ambient temperature		-10°C to +50°C (non-freezing)
	Ambient humidity		90%RH maximum (non-condensing)
	Storage temperature*4		-20°C to +65°C
	Atmosphere		Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt etc.)
	Altitude/vibration		Maximum 1000m above sea level, 0.6 G or less *5 (conforms to JIS C 60068-2-6)

Notes:
1. Only when A7AP option is installed; 2. Can be displayed only on the DU07 operation panel; 3. Can be displayed only on the PU07 or PU04 parameter unit; 4. Temperature applicable for a short time only e.g. in transit; 5. 2.9 m/s² for frame size K and above

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